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The  
United  
States  
of  
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The Commissioner of Patents  
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*Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.*

*Therefore, this*

United States Patent

*Grants to the person or persons having title to this patent the right to exclude others from making, using or selling the invention throughout the United States of America for the term of seventeen years from the date of this patent, subject to the payment of maintenance fees as provided by law.*

Bruce Lehman

Commissioner of Patents and Trademarks

Karnaly Cooper

*Attest*



US005413774A

**United States Patent [19]****Schneider et al.****[11] Patent Number: 5,413,774****[45] Date of Patent: May 9, 1995**

[54] **LONG-LASTING AQUEOUS DISPERSIONS  
OR SUSPENSIONS OF  
PRESSURE-RESISTANT GAS-FILLED  
MICROVESICLES AND METHODS FOR  
THE PREPARATION THEREOF**

[75] Inventors: Michel Schneider, Troinex; Feng Yan, Genève, both of Switzerland; Pascal Grenier, deceased, late of Ambilly, by Nadine Garcel, legal heir; Jérôme Puginier, Le Châble-Beaumont, both of France; Marie-Bernadette Barrau, Geneva, Switzerland

[73] Assignee: Bracco International B.V.,  
Amsterdam, Netherlands

[21] Appl. No.: 991,237

[22] Filed: Dec. 16, 1992

**[30] Foreign Application Priority Data**

Jan. 23, 1992 [EP] European Pat. Off. .... 92810046

[51] Int. Cl.<sup>6</sup> ..... A61K 49/00

[52] U.S. Cl. ..... 424/9.51; 128/660.01;  
128/661.02; 128/662.02; 424/9.52

[58] Field of Search ..... 424/9; 128/662.02, 660.01,  
128/661.02; 530/427

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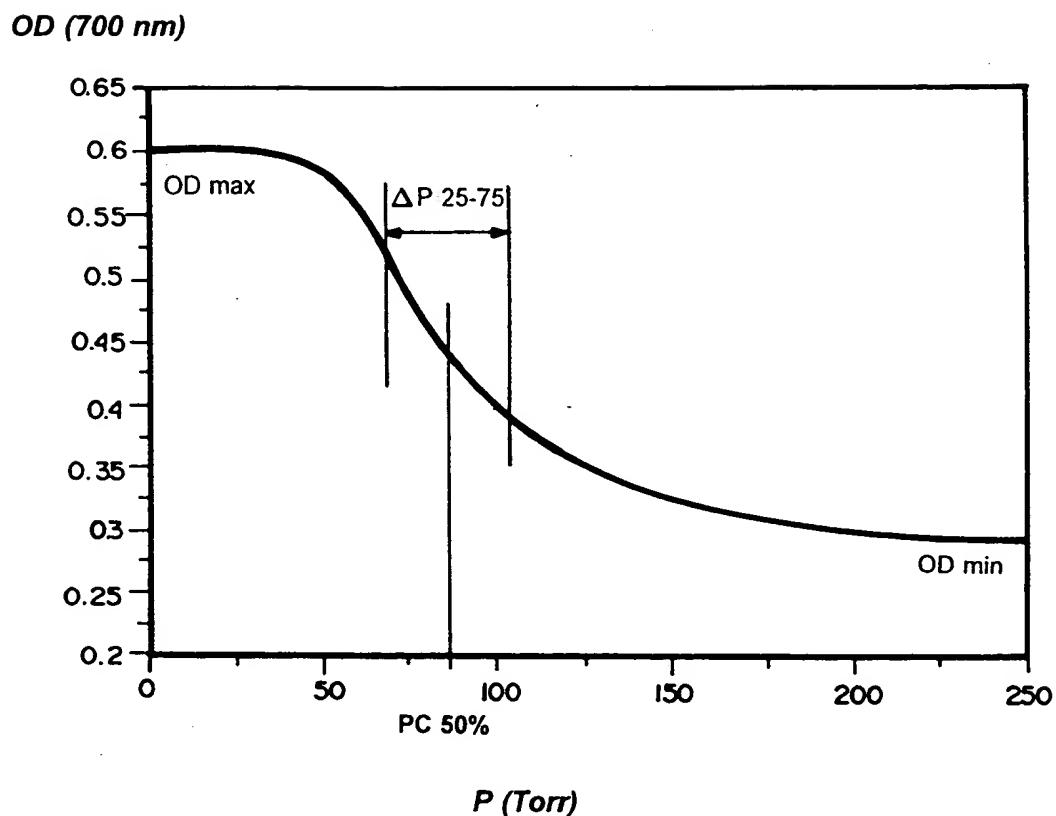
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Primary Examiner—Shailendra Kumar  
Attorney, Agent, or Firm—Nixon & Vanderhye

**[57] ABSTRACT**

One can impart outstanding resistance against collapse under pressure to gas-filled microvesicle used as contrast agents in ultrasonic echography by using as fillers gases whose solubility in water, expressed in liter of gas by liter of water under standard conditions, divided by the square root of the molecular weight does not exceed 0.003.

**14 Claims, 1 Drawing Sheet**



**Fig. 1**